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NEW STINGLESS BEES (MELIPONIDAE) FROM PANAMA AND THE CANAL ZONE

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The present paper has been prepared partly because of my belief that the segregation of new forms from a given area of the world facilitates their recognition by the student who has unidentified specimens from the same region that he desires to name, and partly (and it is the more pressing reason) to enable Prof. Charles D. Michener to include these forms, all from Panama and the Canal Zone, in his forthcoming monograph on the bees of that area.

***Melipona marginata* variety *micheneri*, new variety**

WORKER: The proportions and the sculpturing of the head as in typical *marginata*, but with the clypeus slightly arched as in the varieties *bradleyi* and *illustris*. The head is predominantly black, with the longitudinal stripe (which in most varieties bisects the clypeus) wanting as in variety *carrikeri*. A small, pale yellowish spot (more reddish in the paratype) in each of the antero-lateral angles of the clypeus, with a thin and somewhat uneven stripe traceable upward from each of these spots on the lateral borders of the clypeus. The supraclypeal maculation absent or faint. The yellowish stripe along the inner margin of the eye is narrow and tends to widen only slightly in its downward course, with invasions of brown that give it a slightly discontinuous appearance towards the lower extremity. The labrum pale reddish. The mandibles over their basal half yellowish to ferruginous, of a deeper red over their apical half. The scape ferruginous anteriorly at its base; the flagellum fuscous, with the second joint and the apical joint more or less reddish. The lower half of the face

with silvery-gray hairs, those of the clypeus short and appressed or down-slanting. The feathery pile of the front whitish but, as the ocelli are approached, some of the compound hairs grade into yellowish or fulvous. The hairs of the vertex almost wholly bright fulvous, with a few darker hairs that become apparent only when the tuft is viewed from certain angles (these dark hairs are more numerous in the paratype than in the type). The hairs of the genal area silvery gray, appressed on the upper two-thirds of the genal area, erect and long on the lower one-third. The hairs on the scape also silvery gray but short, the individual hairs not so long as the scape is wide.

Thorax with the sculpturing of the typical variety: the mesopleura, like the mesonotum, black, with uniform, dense, opaque sculpturing. The pronotum with a broad transverse light yellow stripe. The tubercles likewise yellow. A well-developed band of yellow along each side of the mesonotum for its entire length. This band is confluent with the slightly broader concolorous spot over each axilla. The scutellum grades from yellow into pale brown; the pale brown area occupies the basal portion but projects a broad wedge into the apical middle so as to break the continuity of the yellow band around the posterior rim. The mesonotum, scutellum, and upper part of mesopleura covered densely with brightly fulvous hairs. In some lights and from certain angles the fulvous hairs of the mesonotum seem to have a few intermixed hairs of darker hue, but so sparse that they hardly affect the prevailing unicolorous condition. The hairs on the lower one-half to two-thirds of mesopleura and for the most part the hairs of the propodeum silvery gray.

Legs deep reddish to reddish brown, with the apex of the hind tibiae and the outer face of the hind metatarsi black. Light hairs predominate on the basal joints of the legs, the hairs on the under side of the coxae, trochanters, and femora being pure white. The fringing hairs laterally on the fore tibiae intermixed light and dark. The corresponding fringes of the middle tibiae prevailing dark. The eyelash-like hairs that fringe the hind tibiae black. The bristles on the narrow fore metatarsi pale. The bristles fringing the middle metatarsi blackish, but the fine appressed hairs over the outer face of this joint pale, although intermixed with semi-erect darker bristles. The anterior lateral fringe of the hind metatarsi black and the feebly developed posterior lateral fringe also black.

Wings, as in the typical variety, rather uniformly hyaline and with ferruginous venation. Of four wings examined, three had 10 hamuli and one had nine hamuli, an average of 9.75.

Abdomen with the exposed parts of the tergites sculptured as finely and nearly as densely as the mesopleura. The basin-like depression at the base of the first segment ferruginous, the dorsal region beyond reddish (type) or blackened (paratype). The five subsequent tergites black, except that all the tergites have a yellow band (uninterrupted medianly and undulating above) along their apex, that on tergite 6 abbreviated and tending to shrink to a spot. Tergite 1 without hairs except those of the tuft above on each lateral extremity of the abdominal depression. Tergite 2 hairless. Tergites 3 to 6 with black, semi-erect hairs, which tend to increase in length from tergite to tergite. The ventral hairs silvery gray except those of the last sternite, which are blackish.

Length, about 7.25 mm.; width of thorax, 3.25 mm.; length of forewing, including tegula, 6.5 mm.

Of the varieties of *marginata*, only *carrikeri* has facial maculations as restricted as those of *micheneri*. Confusion with *carrikeri* is precluded by the fact that in *micheneri* the hairs of the vertex, mesonotum, scutellum, and upper part of mesopleura are entirely or almost entirely fulvous, whereas in *carrikeri* the hairs of these areas are black. Dark hairs on at least the mesonotum and scutellum are characteristic also of varieties *amazonica*, *bradleyi*, and *torrida*; by these characters and others these bees avoid being confused with *micheneri*. From *illustris*, which, like *micheneri*, has fulvous hairs on the vertex, mesonotum, and upper part of mesopleura, *micheneri* is distinguished by the more restricted maculations of its head, by the denser sculpturing of its mesopleura, and by the mainly black coloration of the tergites beyond tergite 1, these tergites (except for the yellow apical bands) being red to chestnut red in *illustris*. The variety *tumupasae* can also be disassociated from *micheneri* by the sculpturing of its thorax. In contrast to the dense, rather opaque sculpturing of the mesonotum and the mesopleura in *micheneri*, the variety *tumupasae* has the mesonotum subpolished, with fine separated punctures, and the mesopleura shiny, with larger punctures more sparsely distributed over its surface. Also in *tumupasae* the ground color of the abdomen (except for the yellow stripes apically along the tergites) is on the whole a vivid red in contrast to the dark condition with apical stripes in *micheneri*. Because of its variability *marginata*

in some specimens tends to encroach on *micheneri*. However, in all of the specimens of typical *marginata* that have come to my attention there is a well-developed stripe longitudinally bisecting the clypeus that is wholly lacking in *micheneri*, and the stripe part way along the inner orbit of the eye is well developed, even massive, in typical *marginata* while thin and somewhat fragmentary in *micheneri*. In contrast, there is a stripe on the pronotum of *micheneri* that is lacking in typical *marginata*, and the stripe along each side of the mesonotum of *micheneri* is broader and also longer (resembling the condition in *bradleyi* and *illustris*) than the comparable stripe of typical *marginata*, extending for the full length of the mesonotum in *micheneri* instead of beginning about halfway down the mesonotum as in typical *marginata*. The hairs of the legs tend to be pale in typical *marginata* in areas where they are black in *micheneri*. This tendency is particularly apparent in the fringe of eyelash-like hairs that borders the hind tibiae laterally, wholly or predominantly white in typical *marginata*, emphatically black in *micheneri*.

The variety *micheneri* is based on two workers, both from Barro Colorado, Canal Zone, one (the holotype) collected by W. J. Gertsch, February 9, 1936, the other (paratype) by C. D. Michener, March 21, 1945.

***Trigona (Partamona) grandipennis*, new species**

WORKER: Black, with usually rather feeble yellowish maculations; characterized especially by its relatively great size, its conspicuously long wings, and very developed malar space.

Head smooth, broader than long, about as wide as the distance from the outer rim of one of the tegulae to the outer rim of the other. Facial quadrangle almost as wide as long; distance between the summits of compound eyes about equal to the length of the eye. Eyes almost parallel-sided, the distance separating them below about equal to the distance separating them above. Malar space very long, about twice as long as the flagellum is wide. Mandibles somewhat hourglass-shaped, overlapping, their apex broad, its outer two-thirds edentate, its inner one-third bidentate. The labrum simple, without armature. The clypeus and supra-clypeus rising well above the level of the sides of the face; the sides of the clypeus divergently oblique from base to apex, with a sharper divergence one-third of the distance from the apex; clypeus widely truncate along its apical middle, with a strong reces-

sion at each end of the apical middle; the apico-lateral angles of the clypeus separated from the eye by about twice the width of the flagellum. The clypeus with a few faint, shallow punctures. Middle ocellus anterior to the lateral ones, which are raised and tilted outward and are separated from the nearest compound eye by more than twice the long axis of an ocellus; the distance between the inner orbits of the lateral ocelli a little less than the distance between the outer orbit of a lateral ocellus and the nearest compound eye. Flagellum about twice as long as scape and a little wider than scape. Head black, with pale yellowish to dull brownish maculations. The maculation usually brightest on the mandibles (except for the black basal prominences and apical rim) and on the labrum. The rather narrow stripe along the inner orbit of the eye, often feebler above than below, terminates before reaching the summit of the eye but frequently is resumed along the outer orbit as well. A diminutive and usually feeble trace of maculation below the middle ocellus, sometimes wanting. A rather vaguely outlined wide shaft of dull yellow to reddish down the middle of the clypeus, which at its lower extremity puts out a narrow, somewhat curvilinear branch to each side, more or less paralleling the apex of the clypeus. The antennal sockets, sometimes the extreme base of the scape, often the supraclypeus, the under side of the flagellum, and sometimes the genal area more or less dull reddish. Erect hairs on head rather abundant, fairly long, and black on clypeus, front, sides of face, and vertex, grading, however, into brownish or even silvery gray on labrum, inferior margin of mandible, and lower part of genal area. The hairs on the clypeus sparser than those on the front and subequal in length to those fringing the scape, which are about as long as the scape is wide, although some of the hairs towards the base of the scape sometimes exceed this length. Hairs especially long on vertex, lower part of genal area, and mandibles beneath. In addition to the erect hairs, and far less conspicuous than those, are short, appressed, paler hairs over most of the head but sparse or even lacking on the clypeus and usually lacking on lower part of genal area.

Thorax approximately smooth and black, with usually a faint narrow yellowish stripe (stronger in the specimen from Boquete, Panama), which borders each side of the mesonotum from the level of the base of the usually dull reddish brown tegulae to the inclusion as a rule of at least the basal part of the axillae. Tuber-

cles usually also dull reddish brown. An often fragmentary transverse stripe across the posterior half of the pronotum. The erect hairs black on mesonotum, scutellum, and over most of mesopleura, and for the most part approximating in length those on the vertex, but the hairs of the scutellum, at least, longer than those of the other parts mentioned. Hairs on the under side of thorax long and silvery gray. The short appressed to semi-appressed hairs gray and plumose (on the mesopleura at least) but on the whole of dull appearance. The metapleura and sides of the propodeum densely felted with short, rather dull silvery gray tomentum. The middle of the propodeum semi-shiny, with indistinct shallow punctures, more thinly covered than the sides with tomentum. Scutellum short and non-salient.

Legs dark mahogany brown to black, with the metatarsus and small joints of the tarsus of the fore legs, the small joints of the tarsus of the middle legs, and the apical tarsal joint of the hind legs ferruginous (in the specimen from Boquete all the small joints of tarsi are ferruginous). The coxae and trochanters beneath with silvery gray hairs, and such hairs likewise on the under side of the fore and middle femora, particularly on the basal half. Much shorter, blackish hairs on the upper face of usually the fore and of the middle and hind femora. The erect or semi-erect hairs of the fore and middle tibiae (as distinguished from the inconspicuous pale appressed hairs) black, and more erect and more uniformly covering the outer face of the joint in the case of the fore tibiae than in the case of the middle tibiae. The fore and middle tibiae within and especially posteriorly have the hairs long and black. The hind tibiae beneath with black bristles on the anterior one-fourth but with only microscopic, silvery gray, appressed hairs on the posterior three-fourths. Long, eyelash-like, black bristles fringe both the anterior and the posterior contours of the hind tibiae, and black hairs are present at the extreme base of the exterior face. Two or three long black hairs in the deep, basin-like depression that covers most of the exterior face of these tibiae. The metatarsal brushes yellowish to copper-colored, the hairs on the outer face of the middle and hind metatarsi and of the small joints of the tarsi blackish, with inclination to reddish on the first pair of legs. The hind tibiae at their widest a little less than half as wide as long and very deeply hollowed out, somewhat like the bowl of a spoon, beyond their extreme base. The hind metatarsi wide, at their apex about three-fifths as wide as the hind tibiae, somewhat more contracted towards their base.

Wings conspicuously long, with a rather uniform dull yellowish tinge, the median cell slightly deeper in tint, the venation dull ferruginous for the most part, but the stigma and marginal vein often brighter ferruginous to orange-colored. Tegulae dull reddish brown. Number of hamuli per wing usually five to seven. Of 44 wings examined, seven had five hamuli, 26 had six hamuli, 11 had seven hamuli, an average of 6.09.

Abdomen nearly of same width as thorax, blackish (sometimes more or less invaded by dark reddish brown), virtually smooth on tergites 1 and 2, but tessellate to slightly blotchy at the posterolateral extremities of tergite 2, associated with the presence in these areas of diminutive appressed black hairs. Similar slightly longer, semi-appressed black hairs rather densely covering the exposed apical surfaces of tergites 3 to 6, which are finely tessellate. The ordinarily concealed basal surfaces of these tergites smooth. The apical part of the sternites with erect, silvery gray hairs flanked by concolorous sericeous patches on the apical edge of sternites 3 to 5, but the hairs on the last visible sternite usually black.

Length, 6.5 to 7.5 mm.; width of thorax, about 2.75 mm.; length of forewing, including tegula, about 8.75 mm.

Neither the queen nor the male of *grandipennis* are known but the worker differentiates itself structurally from other members of the subgenus *Partamona* by its greater size, its longer malar space, and its conspicuously longer wing length. The forewing attains a length of 8.75 mm., which is not much less than that of *Trigona* (*Trigona*) *trinidadiansis silvestriana* Vachal. In *grandipennis* the ornamentation of the clypeus is rather distinctive.

Only two specimens of the total type material are from Panama: one without locality designation; the other from Boquete, Province of Chiriqui, collected March 20, 1923, by F. M. Gaige.

The other specimens are from Costa Rica, collected by H. Rogers at Rio Susio (including the holotype) and at Irazu at an elevation of 6000 and 7000 feet.

***Trigona* (*Geotrigona*) *leucogastra* variety
chiriquiensis, new variety**

WORKER: Like typical *leucogastra* structurally and in the coloration of its wings, the venation of which is throughout bright orange, although the tegulae are dark. Differs from typical *leucogastra* in that the erect hairs of the head and thorax, instead of be-

ing black, are fulvous on the clypeus, scape, front, vertex, sides of face, mesonotum, tegulae, mesopleura, and scutellum. The hairs of the lower part of the genal area, labrum, and those fringing the mandibles below pale. The tomentum on the thorax approximately concolorous with the longer hairs.

Like typical *leucogastra* the variety *chiriquiensis* has predominantly black hairs on the legs, with the hairs on the coxae, on the under side of the front and hind trochanters, and on the basal part beneath of the femora usually pale as in the typical variety. The hairs on the under side of the middle trochanters faintly yellowish.

Of 42 wings examined, 35 had five hamuli and seven had six hamuli, an average of 5.17.

Tergites 2 to 6 of the abdomen with white hair bands (as in the typical variety) and the hairs of the sternites likewise white.

Length, 4.5 to 5 mm.; width of thorax, about 2 mm.; length of forewing, including tegula, about 5.5 to 6 mm.

Among the *Geotrigona* the members of the *leucogastra* group are distinguished by their much reduced malar space (merely linear at the inner extremity where mandible and eye nearly touch), by the long hairs fringing the scape posteriorly (these hairs are about one and one-half times as long as the scape is wide), by the inwardly placed tooth-like angle on the apical contour of the hind tibiae, and by the white hair bands on tergites 2 to 6. Although the two denticles at the upper extremity of the apex of the mandible are inconspicuous, the mandible is not edentate as noted in the original description of typical *leucogastra* (Cockerell, 1914, Jour. New York Ent. Soc., vol. 22, p. 309).

Of the specimens of *chiriquiensis* that constitute the type material, five were collected by Champion on the Volcan de Chiriqui, at an elevation of 2500 to 4000 feet, and one at Caldera at an elevation of 1200 feet, both localities in the Province of Chiriqui, Panama. Seventeen specimens, including the holotype, were obtained likewise at El Volcan de Chiriqui by F. E. Lutz and W. J. Gertsch on February 20, 1936. Two specimens were collected at Red Tank, Canal Zone, on July 1, 1924, by N. Banks. A single specimen was secured at El Valle de Antón, Coclé Province, Panama, by N. L. H. Krauss in November, 1946.

***Trigona (Geotrigona) acapulconis* variety
kraussi, new variety**

WORKER: Like typical *acapulconis* structurally, but differing in the coloration of its wings and of its hairs.

Head black, with the mandibles briefly red before the apex, the antennal sockets ferruginous, and flagellum (wanting in the holotype but present in the paratypes) brownish and darker above than below. Silvery gray to, in some cases, slightly yellowish are: the erect as well as the appressed hairs of the clypeus and sides of the face, the densely pruinose area over most of the genal area, the erect hairs over the lower part of the genal area, the hairs of the labrum, and to a less extent those along the inferior margin of the mandibles. Fuscous to black are some of the hairs of the front (particularly the upper part of the front), the hairs on the vertex, many of the minute erect hairs on the scape, and occasionally some of the hairs along the inferior margin of the mandibles.

Thorax black. The metapleura and the sides of the propodeum felted (concealingly so in the case of the holotype), with silvery gray tomentum interspersed with concolorous or slightly more yellowish erect hairs. The erect hairs of the mesopleura soiled gray owing to interspersed blackish hairs among those of paler hue, especially as the tegulae are approached. The erect hairs of the tegulae, those of the mesonotum, and also those of the scutellum are black or blackish.

Legs, like the other body parts of *kraussi*, predominantly black, to the inclusion of the tarsal joints. Black, too, are the bristles on the upper face of the fore femora (only sparsely present and mostly towards the apex), on outer and inner face of the fore tibiae, the lateral fringes of the fore metatarsi, hairs on outer and inner faces of middle tibiae, on outer face of the middle metatarsi to the inclusion of the lateral hairs, on upper face of the hind femora, the eyelash-like fringing hairs along each side of the hind tibiae, the hairs over the outer face of the hind metatarsi and over the outer face of the associated small tarsal joints. Silvery gray to whitish are: the hairs of the coxae, of trochanters below, under side of femora basally at least but sometimes inconspicuously beyond, and the dense, uniform, microscopic hairs on the raised area of the under side of the hind tibiae. The hairs on the inner face of the small joints of the tarsi also tend to be pale; the brushes on the inner face of the metatarsi range from yellowish to bronze, sometimes even verging on black, especially in the case of the hind metatarsi.

Tegulae blackish but the wings rather devoid of dark areas, in spite of the minute hairs that cover them, tending to be rather uniformly subhyaline, with bright ferruginous to orange-colored ven-

ation and stigma. Of six wings examined, five had five hamuli and one had six hamuli, an average of 5.17.

Abdomen black. Tergite 1 glabrous and sculptureless or virtually so. The succeeding tergites smooth and hairless on their often concealed basal areas but each apically with a progressively wider band of light tessellation that is covered densely with black, semi-erect bristles. These bristles tend to be longer from tergite to tergite (although even towards the apex of the abdomen of only moderate length) and, when the segments are telescoped (which is usually the case), form a continuously bristle-covered surface. The ventral part of the abdomen with silvery gray to white hairs.

Length, 4.5 to 5 mm.; width of thorax, about 2 mm.; length of forewing, including tegula, about 5.5 to 6 mm.

Strand (1917, Arch. Naturgesch., vol. 83, div. A, no. 11, pp. 70–71) designated *acapulconis* as a new species with diffidence because of its putative resemblance to *subterranea* Friese (= *mombuca* variety *subterranea*). However, in *acapulconis* the malar space is vestigial, eye and mandible at their point of closest approximation almost grazing each other, whereas in *subterranea* the malar space is distinct, as noted by Friese (1901, Zeitschr. Syst. Hymenopterologie u. Dipterologie, vol. 1, p. 265).

The variety *kraussi* can readily be separated from the typical variety of *acapulconis* by the greater clarity of its wings, with their bright ferruginous venation and stigma. In typical *acapulconis* the wings are rather uniformly smoky, and the venation tends to be fuscous. The character of the hairs dorsally on the abdomen also differs markedly in the two forms. In *kraussi* the exposed part of tergites 3 to 6 and less emphatically also the apex of tergite 2 are covered with black, thick, relatively short bristles. In typical *acapulconis* the hairs of the corresponding areas are long (especially on the apical tergites) and white, those of tergite 6 tending to be feathery, much as in *leucogastra*. In addition to having black bristles instead of white hairs on the abdominal tergites, *kraussi* is readily separated from *leucogastra* by the presence of only very minute erect hairs on the scape in contrast to the long hairs (about one and one-half times the width of the scape) that fringe the scape of *leucogastra*.

Trigona (*Geotrigona*) *acapulconis* variety *kraussi* is based on three workers, all from Panama and bearing the following data: Fort Clayton, December, 1946 (N. L. H. Krauss), the holotype; Laguna, 25 miles northwest of Chame, Panama Province, 2600

feet, April 29, 1945 (C. D. Michener), paratype; Old Panama, December 12, 1945 (C. D. Michener), paratype.

***Trigona (Scaptotrigona) mexicana* variety
subobscuripennis, new variety**

WORKER: Like typical *mexicana* structurally, with a comparable prevalence of shiny interspaces between the punctures on each side of the mesonotum.

Head black with these exceptions: the clypeus varies from pale yellowish to brownish or brownish edged with yellow and is often traversed by two parallel, longitudinal, darkish stripes (frequently blurred); the sides of the face to the level of the base of the clypeus or a little beyond usually pale watery yellow, with the maculation as a rule diagonally truncate above; the supraclypeus is sometimes brown and sometimes yellow or a combination of the two; the scape tends to be yellowish or ferruginous in front; the flagellum inclines to be dull reddish to bright reddish; the mandibles are rather bright reddish except for the narrow dark apical edge and the black basal prominences; the labrum is red or sometimes a cloudy red; the genal area is not infrequently suffused with deep brownish red. Lower half of head devoid of erect hairs except for the dark bristles on the labrum and the usually lighter hairs fringing the inferior margin of the mandibles. The upper half of the head with black hairs, increasing in length upward on the front to reach their maximum on the vertex.

Thorax black, with black hairs on mesonotum, scutellum, and mesopleura, but with patches of silvery gray pile bordering the tubercles densely and with matted, appressed, silvery gray to white pile covering extensively the metapleura and the sides of the propodeum.

Legs prevailingly black, now and then invaded by reddish brown, particularly on the hind femora and tibiae, the latter frequently with a large red maculation on their inner side. The small joints of the tarsi more or less ferruginous, and the hind metatarsi usually bordered by a narrow ferruginous stripe. The hairs of the legs in the main black except for grayish to even whitish hairs usually on the under side of the trochanters and adjacent area at the base of the femora, the microscopic pale hairs that densely cover the under side of the hind tibiae, and the often copper-colored metatarsal brushes.

Wings lack complete clarity, faintly smoky, especially in the

marginal and median cells. The stigma and venation dull ferruginous instead of vivid orange as in typical *mexicana*. Tegulae black, with usually a small brown pupil. Number of hamuli usually seven, infrequently six, rarely eight, and still more rarely five or nine. Of the wings examined, 156 had seven hamuli, 20 had six hamuli, 11 had eight hamuli, two had five hamuli, and one had nine hamuli, an average of 6.94.

Abdomen black, with the usually exposed parts of the tergites covered with a fine tessellation. Particularly delicate is the tessellation on tergites 3 to 6, with the result that these tergites are semi-shiny. Tergites 3 to 6 and in some specimens also tergite 2 with short, semi-erect black bristles on the tessellated areas, contrasting in this respect with typical *mexicana*, which has these areas bare. The ventral side of the abdomen covered with silvery gray hairs.

Length, about 5 mm. to about 5.5 mm.; width of thorax, 2.25 mm. to 2.50 mm.; length of forewing, including tegula, about 6 mm.

MALE: Can be differentiated from the male of typical *mexicana* principally by the coloration of the wings, which accord with those of the worker.

Differs from the worker by the usual sexual characters: narrower face; eyes strongly convergent below; much reduced malar space (even the outer half shorter than the joints of the flagellum are wide); narrower hind tibiae, convex over their outer face and with a slight angulation at the apex of their posterior contour; narrower hind metatarsi, with their anterior contour straight and their posterior contour barely convex; and the usual abdominal differences.

Head with more tessellation over the clypeus, sides of face, and front than characterizes the head of the worker, which is almost smooth on at least its lower half. The maculations of the lower half of the face tend to be subdued or absent or nearly absent in contrast to the usually fuller maculation in this area of the worker. The scape with a yellow stripe in front and the flagellum reddish beneath. The labrum pale reddish as is also the apical half of the mandible, the basal half being black. The hairs of the vertex black but those of the front, unlike the condition in the worker, silvery gray.

Thorax with the longer hairs of the mesonotum, scutellum, and mesopleura black as in the worker but with a lower growth of sil-

very gray hairs, more especially on the mesopleura. The metapleura and sides of propodeum densely matted with whitish appressed pile, resembling the condition in the worker.

Legs (in most of the specimens before me) reddish brown rather than black, but this may be due to immaturity. The coloration of the hairs of the legs approximates the condition in the worker: black hairs occur on the joints where black hairs are indicated for the worker and pale hairs where pale hairs are set down. The inner face of the metatarsi with dense, stunted hairs which tend to be silvery gray.

Wings faintly smoky, as in worker. Of 14 wings examined, seven had six hamuli and seven had seven hamuli, an average of 6.50.

Abdomen blackish dorsally (except for the usually ferruginous tergite 7) but more or less suffused with red ventrally, especially towards the base. Exceedingly short, appressed black hairs inconspicuously present on tergites 1 to 6. Longer dark hairs on tergite 7 and sparsely fringing the lateral contour also of tergites 4 to 6. The last three exposed sternites densely covered with silvery gray to whitish appressed silky hairs that glint as the light strikes them.

Length, about 5 mm.; width of thorax, 2.25 mm. to 2.50 mm.; length of forewing, including tegula, about 6 mm.

Cockerell (1913, *Psyche*, vol. 20, p. 11) stated that a worker of Cockerell's *Trigona bipunctata wheeleri* which had been sent to Friese had been designated by Friese as *Trigona mexicana* Guérin. Cockerell then went on to say: "I have what I consider to be *T. mexicana* from Rio Nautla, Mexico (Townsend); it has grayish-hyaline wings, and is distinct from the present insect." This Rio Nautla insect was donated by Cockerell to the British Museum in 1914, and there I had an opportunity of examining it some years ago. Personally I find it difficult to differentiate this specimen from metatypes of *wheeleri* from Guatemala (Englehardt), and I am inclined, therefore, to take my stand with Friese. So far as my observations extend, true *mexicana* has as its territory Mexico and Guatemala, while in Panama occurs the closely related bee of somewhat darker wing here designated variety *subobscuripennis*.

It is not by the coloration of the wings alone, however, that the two forms can be differentiated. In *subobscuripennis* the facial markings occupying the lower half of the face tend to be more distinct; in typical *mexicana* they are often dull to absent. Another

distinction is that, whereas in typical *mexicana* there are no erect hairs on tergites 1 to 5 and the erect hairs on tergite 6 are largely confined to an apical fringe, in *subobscuripennis* there are black bristles present on the apices of tergites 3 to 6 even though often short and not infrequently sparse. Great variability occurs, however, both in the extent and clarity of the facial maculations even within a series from the same locality, and a similar range of variability can be noted also in the length and abundance of the black bristles on the abdominal tergites. In some specimens the bristles are present not only on tergites 3 to 6 but on tergite 2 as well; in others, however, the paucity of the bristles is such that these specimens approximate the condition of typical *mexicana*. These comparisons between the two forms are based on the worker.

Among the specimens obtained many years ago by the American Museum from Dr. H. Friese is a specimen (bearing a type label) that Friese designated *Trigona bipunctata ruficornis*. It was collected at San José, Costa Rica, in 1903 by Burgdorf and is the same insect here described as *subobscuripennis*. I have combed through the literature in vain for a description of Friese's *ruficornis* and am forced to conclude that it is a manuscript name. However, the validity of this name is in any event challengeable, for Frederick Smith described a *Trigona ruficornis* from India as long ago as 1870 (Trans. Zool. Soc. London, vol. 7, p. 194).

From the closely related *Trigona* (*Scaptotrigona*) *bipunctata* Lepeletier, *subobscuripennis* can be differentiated most readily by the absence of the two spots consisting of appressed silvery gray hairs that ornament as a rule tergite 4 and also tergite 5 of the abdomen of *bipunctata*.

The holotype and allotype of *subobscuripennis*, as well as a large series of paratypes, were collected at Progreso, Province of Chiriqui, Panama, on April 25, 1923, by F. M. Gaige. Other specimens from the same locality and taken by the same collector bear dates of April 15 and 17, 1923. Supplementary specimens of this bee collected in the Province of Chiriqui were derived from the following localities: Bugaba (Champion); Boquete, March 3, 27, 1923 (F. M. Gaige); El Volcan de Chiriqui (Champion), February 20, 25, 1936 (F. E. Lutz), February 20, 25, 1936 (W. J. Gertsch), February 27, 1936 (Gertsch, Lutz, Wood).

In addition to the specimens from Panama there has been included in the type material a series from San José, Costa Rica, collected on April 27, 1937, by A. Alfaro, and a specimen from Gua-

niles, Costa Rica, collected in July, 1915, by D. E. Harrower.

***Trigona* (*Scaptotrigona*) *pectoralis* variety
barrocoloradensis, new variety**

WORKER: Differs from the typical variety in having the darkened area of the front more extensive. This darkened area, instead of being confined to the region adjacent to the ocelli or extending downward to at most the upper extremity of the supraclypeus, in *barrocoloradensis* frames the yellow supraclypeus broadly on each side, thereby making the supraclypeus conspicuous, and extends downward, its sides convergent, to or nearly to the antennal sockets.

The mesonotum traversed by two narrow, reddish, longitudinal stripes which diverge posteriorly, dividing the mesonotum into three subequal parts. The median part (the largest) faintly dull reddish, densely mottled with black; the flanking parts black. Thoracic hairs, as in typical variety, yellowish, and the metapleura and sides of propodeum felted, as in typical *pectoralis* and *panamensis*, with dense, white, appressed tomentum.

Unlike most other specimens from the Canal Zone and adjacent areas of Panama, in which the hairs fringing the hind tibiae are black or predominantly black [*Trigona* (*Scaptotrigona*) *pectoralis panamensis* Cockerell], the variety *barrocoloradensis* accords with typical *pectoralis* in having the fringing hairs bright fulvous.

Wings of the same appearance as those of the typical variety. Tegulae, like the venation, bright fulvous. Of the wings examined, six had six hamuli, 49 had seven hamuli, and one had eight hamuli, an average of 6.91.

Abdomen colored as in the typical variety, with the exposed parts of the tergites felted over densely with appressed yellowish hairs. This matted surface is especially notable on tergites 3 to 6, where there are erect yellowish bristles in addition to the appressed hairs. Tergite 1 beyond the basal depression and tergite 2 also densely felted with appressed hairs, but these are apt to escape attention unless the abdomen is viewed from the side instead of from above. Venter with silvery gray hairs.

Length, about 5.5 mm.; width of thorax, about 2.5 mm.; length of forewing, including tegula, about 6 mm.

MALE: I find it difficult to establish any dependable characters that differentiate what I believe to be the male of *barrocoloradensis* from the male of typical *pectoralis*.

It is with some hesitation that the present variety is proposed. The amount of black on the front tends to be variable in *pectoralis*, and it is not unusual in a series of *pectoralis* workers from a given locality to find specimens that are more pronouncedly melanistic than their fellows and now and then an individual that comes close to the worker of *barrocoloradensis*. What differentiates the workers from Barro Colorado is that they so uniformly illustrate the extreme of dark maculation on the upper part of their head instead of presenting that condition only in an exceptional individual or two.

The somewhat contrasted areas of coloration on the mesonotum of the worker of *barrocoloradensis* are reminiscent of the condition in *Trigona* (*Oxytrigona*) *tataira* variety *mediorufa* Cockerell. Although now and then a specimen in a series of typical *pectoralis* has two narrow reddish lines traversing its mesonotum lengthwise, all the workers from Barro Colorado that I have had occasion to examine share this character.

The tawny hairs that fringe the hind tibiae serve as additional evidence that the Barro Colorado workers of *pectoralis* tend to separate themselves from the specimens of the adjacent regions, which are assignable, in so far as the available specimens are indicative, to *pectoralis* variety *panamensis*.

The holotype and a number of the paratypes were collected on March 23, 1933, in part by F. E. Lutz and in part by myself. Additional specimens that are included in the type material were obtained by F. E. Lutz on February 6, 1936.

With the series of workers collected by Lutz on February 6, 1936, there was a single male. Eleven males had been collected April 10, 1924, by J. C. Bradley in addition to a single worker of corresponding date.

All the specimens were collected on Barro Colorado Island in the Canal Zone.